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John H. Lieder

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EXAMINER

BRINEY III, WALTER F

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**BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES**

Application Number: 09/996,255  
Filing Date: November 28, 2001  
Appellant(s): LIEDER ET AL.

\_\_\_\_\_  
Alan Pedersen-Giles, Reg. No. 39,995  
For Appellant

**EXAMINER'S ANSWER**

This is in response to the appeal brief filed 14 June 2005 appealing from the Office  
action mailed 14 January 2005.

**(1) Real Party in Interest**

A statement identifying by name the real party in interest is contained in the brief.

**(2) Related Appeals and Interferences**

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

**(3) Status of Claims**

The statement of the status of claims contained in the brief is correct.

**(4) Status of Amendments After Final**

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

**(5) Summary of Claimed Subject Matter**

The summary of claimed subject matter contained in the brief is correct.

**(6) Grounds of Rejection to be Reviewed on Appeal**

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

**(7) Claims Appendix**

The copy of the appealed claims contained in the Appendix to the brief is correct.

**(8) Evidence Relied Upon**

5,987,120	HWANG et al.	11-1999
4,540,853	ALBOUY	11-1985
6,590,973	BIJMAN et al.	7-2003; filed 11-2000

**(9) Grounds of Rejection**

The following grounds of rejection have been amended strictly for clarity without presenting any new grounds of rejection:

*Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. **Claims 1-6, 13, 17, 18, 20, 21, and 27-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hwang et al. (US Patent 5,987,120) in view of Albouy (US Patent 4,540,853).**

**Claim 1** is limited to *a circuit for detecting a reversal in polarity*. Hwang discloses a device for detecting reversal of voltages on a telephone line (abstract). Hwang discloses a "Schmidt trigger" (i.e. "a Schmidt trigger connected in series with the low-

pass filter") (figure 1, element 593). Hwang discloses a "low-pass filter" (figure 1, elements 59, 591, 592). Hwang also discloses a second Schmidt trigger (figure 1, element 58), which acts to characterize the existing line voltage, but Hwang does not disclose the construction of the Schmidt trigger. The second Schmidt trigger (58) corresponds in position to the "differential amplifier" of the claim, however because the construction is unknown, it cannot be said that it is a "differential amplifier". Therefore, Hwang anticipates all limitations of the claim with the exception of "a differential amplifier".

Albouy teaches the standard construction of an analog-to-digital Schmidt trigger like the one used by Hwang. The device includes a "differential amplifier" (Albouy, figure 3, element 2).

It would have been obvious to one of ordinary skill in the art at the time of the invention to construct a Schmidt trigger using a "differential amplifier" as taught by Albouy for the purpose of implementing the polarity detection circuit of Hwang.

**Claim 2** is limited to *the circuit described in claim 1*, as covered by Hwang in view of Albouy. Albouy teaches an "operational amplifier" (figure 3, element 2) *having a feedback loop from an output terminal thereof to a non-inverting "input terminal" thereof*. Therefore, Hwang in view of Albouy makes obvious all limitations of the claim with the exception of "a feedback loop from an output terminal thereof to an inverting input terminal thereof". It is noted that the circuit of Hwang is disclosed with a non-inverting Schmidt trigger (figure 1, element 58) coupled with a NMOS transistor (figure 1, element 59). However, reversing the inputs and feedback of the Schmidt trigger and using a

PMOS transistor will result in the same circuit, it is merely a reversal of internal polarity and is obvious, see *In re Gazda*, 219 F.2d 449, 104 USPQ 400 (CCPA 1955).

Therefore, Hwang in view of Albouy makes obvious all limitations of the claim.

**Claim 3** is limited to *the circuit described in claim 1*, as covered by Hwang in view of Albouy. Albouy teaches that the Schmidt trigger comprises an “operational amplifier having a feedback loop from an output terminal thereof to a non-inverting input terminal thereof” (figure 3, element 2). Therefore, Hwang in view of Albouy makes obvious all limitations of the claim.

**Claim 4** is limited to *a method for detecting a polarity reversal in a telephony circuit*. It is noted that steps a-c of this claim are related to making the connections necessitated by the circuit of claim 1, as covered by Hwang in view of Albouy. Clearly, the connections are inherently required and as such Hwang in view of Albouy makes obvious these limitations. Furthermore, claim 4 includes the limitation of “determining polarity stasis or reversal based upon the output of the Schmidt trigger”. Hwang discloses determining the existence of a polarity reversal by examining the output of the first Schmidt trigger (figure 1, element 593) (column 3, lines 10-14 and 36-40).

Therefore, Hwang in view of Albouy makes obvious all limitations of the claim.

**Claims 5 and 6** comprise making the connections necessary for the devices of claims 2 and 3, respectively.

**Claim 13** is limited to inherent properties of the circuit components of figure 1 made obvious by Hwang in view of Albouy. Specifically, the Schmidt trigger (58) of Hwang has been replaced with the differential amplifier disclosed by Albouy. As seen in

figure 3 of Albouy, the Schmidt trigger's differential amplifier (2) comprises two inputs, for "comparing the relative voltage of two inputs." The combination of elements (59), (591) and (592) seen in figure 1 of Hwang correspond to a low-pass filter that prevents polarity reversals from charging the capacitor C3 and raising the voltage at node C filter out the polarity reversals. See figure 2, line C. This prevention corresponds to "filtering out a polarity reversal that last shorter than a defined time," i.e. ringing as seen in figure 2. The Schmidt trigger (593) seen in figure 1 of Hwang clips any polarity reversal below its threshold voltage so that there is a zero output at node B. See figure 2, line B. This clipping corresponds to "filtering out polarity reversals where the final relative voltage is below a defined threshold." Therefore, Hwang in view of Albouy makes obvious all limitations of the claim.

**Claim 17** is limited to *the method of claim 13*, as covered by Hwang in view of Albouy. Hwang discloses a low-pass filter (figure 1, elements 59, 591, 592), which is used for suppressing polarity transition detections from ringing voltages (i.e. "wherein the defined time is such so as to filter out any polarity reversal induced by an incoming ring signal") (column 2, lines 45-59). Therefore, Hwang in view of Albouy makes obvious all limitations of the claim.

**Claim 18** is limited to *the method of claim 13*, as covered by Hwang in view of Albouy. Hwang discloses an Schmitt trigger (figure 1, element 593). Schmitt triggers are known to include a hysteresis effect that is selected to prevent unwanted transitions. Because the device of Hwang is designed only to detect true polarity reversals, it is inherent that the Schmitt trigger is designed to "filter out any polarity reversal caused by

any of battery voltage drops, line disconnections, or loop current drops" (column 1, lines 39-42). Therefore, Hwang in view of Albouy makes obvious all limitations of the claim.

**Claim 20** is essentially the same as claim 1, and is rejected for the same reasons. Specifically, "the comparator" of this claim corresponds to the second Schmidt trigger (58) as disclosed by Hwang and as replaced by the Schmidt trigger (2) as taught by Albouy. The "low pass filter" of this claim corresponds to the low pass filter elements (59), (591) and (592) as disclosed by Hwang. And finally, the hysteresis element of this claim corresponds to the first Schmidt trigger (593) as disclosed by Hwang. Therefore, Hwang in view of Albouy makes obvious all limitations of the claim.

**Claim 20** is limited to *the apparatus of claim 20*, as covered by Hwang in view of Albouy. As pointed out in the rejection of claim 20, the hysteresis element of that claim corresponds to the Schmidt trigger (593) as disclosed by Hwang. Therefore, Hwang in view of Albouy makes obvious all limitations of the claim.

**Claim 27** is essentially the same as claim 17 and is rejected for the same reasons.

**Claims 28 and 29** are essentially the same as claim 18, and are rejected for the same reasons.

2. **Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hwang in view of Albouy and further in view of Bijman.**

A note on the following rejection: the combination of Bijman has been rendered moot in view of claim 7 being cancelled. However, the below rejections are maintained to avoid introducing a new ground of rejection in this Examiner's Answer.



**Claim 12** is limited to *the method as claimed in claim 4*, as covered by Hwang in view of Albouy. Hwang discloses capacitors (figure 1, elements C1, C2) that block DC current from entering the detector. Therefore, Hwang in view of Albouy makes obvious all limitations of the claim with the exception *wherein the differential input voltage comprises DC voltage*.

Bijman teaches polarity detection circuitry (figure 3). The input of the detector uses a differential amplifier, whose output is coupled to a zero-crossing detector (i.e. first Schmidt trigger of Hwang 593). Replacing the input circuitry of Hwang with that of Bijman would result in the same functionality with a reduction in components.

It would have been obvious to one of ordinary skill in the art at the time of the invention to replace the input circuitry of Hwang with the more economical input circuitry of Bijman for the purpose of reducing the number of parts needed and the space and cost associated with those extra parts.

Hwang discloses a low-pass filter (figure 1, elements 59, 591, 592) that filter out ringing polarity transitions (i.e. *further comprising eliminating voltage polarity transitions that are shorter than a defined time*) (figure 2, graph C). Therefore, Hwang in view of Albouy and further in view of Bijman makes obvious all limitations of the claim.

#### **(10) Response to Argument**

The appellant's allegations that Hwang in view of Albouy fails to disclose or teach all elements of the claims are incorrect. As will be shown, the combination of Hwang in view of Albouy makes obvious all limitations of claims 1-6, 12, 13, 17, 18, 20, 21 and

27-29; note that the Final Rejection of claim 12 as being obvious under Hwang in view of Albouy and further in view of Bijman has been reconsidered as a Final Rejection as being obvious under Hwang in view of Albouy. In particular, it will be shown that Hwang in view of Albouy discloses or teaches: (1) "a low pass filter;" (2) "filtering out a polarity reversal that lasts shorter than a defined time;" and (3) that it would have been obvious to one of ordinary skill in the art at the time of the invention to combine the teachings of Hwang and Albouy to arrive at the claimed invention.

A synopsis of Hwang et al. is hereby submitted to aid in understanding the outstanding rejections and exactly how they apply to the claim language. Hwang discloses a device for identifying a line reversal/ringing signal of a telephone set. This device differentiates between these two telephony signals with similar detection criteria, i.e. transient pulses that appear across the tip and ring lines of a telephone subscriber loop. As seen in figure 2, a line-reversal (line T/R) creates a single pulse (line A) during a first predetermined period of time, while a ring (line T/R) creates a series of closely spaced pulses (line A) during a second predetermined period of time. It is submitted that line reversals and ringing signals are special classes of polarity reversals, which in general comprise two parts, a pulse and a silence interval. Line-reversals comprise one pulse and a long silence interval. Ringing comprises a plurality of pulses with short silence intervals.

Universal to detecting both the line-reversal and ring signal, the device disclosed by Hwang translates transient voltages on the tip and ring lines into voltage pulses as seen at node A of figure 1. Also see trace A of figure 2. In distinguishing whether a

line-reversal or ringing just occurred, the system of Hwang uses a series combination of a resistor (R5) and a capacitor (C3). The output of this circuit is taken at the junction of the resistor and capacitor, such that the output of the circuit comprises slow moving voltages only. With respect to point (1) above, this structure corresponds to a low-pass filter. Such an arrangement is depicted in figure 1 of the appellant's specification—a series combination of a resistor (106) and a capacitor (130) with an output node B. Although the elements of the low-pass filter of Hwang are not exactly arranged as the low-pass filter of the appellant's figure 1, the claim language does not stipulate how the particular elements of the low-pass filter are to be arranged. Rather, the claim language nominally recites "a low-pass filter connected in series with the amplifier." As seen in figure 1 of Hwang, the low-pass filter is connected in series with the amplifier (58). Particularly, the filter includes a control transistor at its output node C. Furthermore, the plain claim language neither recites how the low-pass filter is to operate nor what components it may or may not comprise. As such, the rejection of the low-pass filter element is appropriate.

When a line reversal occurs, the output at node C slowly charges in accordance with the RC time constant (i.e. the amount of time it takes to charge capacitor 592 as a function of the size of resistor R5 and the capacitor). This charging is depicted as the logarithmic curve in figure 2, waveform C. Eventually the capacitor becomes charged enough to trigger the first Schmidt trigger (593) creating a pulse at node B. In contrast, when a ring occurs, the output at node C is prevented from fully charging because the ring pulses do not last long enough to fully charge the capacitor. Subsequently,

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Schmidt trigger (593) does not trigger until ringing ceases. In this way, a line reversal substantially comprising a single pulse with a long silent interval will be passed by the resistor-capacitor filter of Hwang, however, a ring substantially comprising a plurality of closely spaced pulses will not be passed by the resistor-capacitor filter of Hwang. With respect to point (2) above, a polarity reversal (i.e. ring pulse) with a short silence interval between it and the next polarity reversal (i.e. "last[ing] shorter than a defined time") will not charge capacitor (592), essentially filtering out the polarity reversal at nodes C and B.

With respect to point (3) above, it is noted that Hwang does not disclose the details of the second identified Schmidt trigger (58). This noted deficiency prevents one of ordinary skill in the art from simply implementing the invention disclosed by Hwang with no other knowledge, and requires one of ordinary skill to use available knowledge to overcome the deficiency. To this end, the teachings of Albouy were presented. The apparatus as taught by Albouy serves a similar purpose as the device of Hwang, including many similar elements such as two inputs for a subscriber line, a Schmidt trigger (2) at the input, a low-pass filter (4) and a second comparator comprising elements (6)-(10). Most notably, the Schmidt trigger (2) is depicted as an operational amplifier with positive feedback in order to establish the quintessential hysteresis used by all Schmidt triggers. Operational amplifiers were known components at the time of the invention and were notoriously well-known for their ease of use and low cost. Besides this, the lack of teaching by Hwang would inherently motivate one of ordinary skill in the art to use any commonly known part to implement the device of Hwang.

Attention is now drawn to the appellant's arguments submitted in the brief.

A. Claims 1-6, 13, 17, 18, 20, 21 and 27-29 are unpatentable under 35 U.S.C. § 103(a) over Hwang et al. in view of Albouy.

1. Claims 1-6, 20, 21 and 27-29:

Claims 1-6, 20, 21 and 27-29 stand rejected under 35 U.S.C. § 103(a) as being obvious over U.S. Patent 5,987,120 (Hwang et al.) in view of U.S. Patent 4,540,853 (Albouy). The examiner respectfully disagrees with the appellant's assertion that any error occurred in rejecting these claims.

a. Hwang et al. in view of Albouy when combined make obvious all claim limitations:

On page 4, lines 4-25 of the brief, the appellant alleges that the filter of Hwang comprising elements (59), (591) and (592) does not perform the functions of a low-pass filter. In support, the appellant points to Exhibits (A), (B) and (C). In particular, on page 412 of exhibit (A) the frequency response of a low-pass filter is illustrated, particularly showing that only signals within a passband are left unattenuated. Figures 2(d) and 2(f) of exhibit (B) the frequency responses of an impulse and a sharp transition are depicted, with frequency components extending out infinitely. The appellant uses these in conjunction with figure 2 of Hwang to establish that the sharp transitions at node C create frequencies outside of a low-pass filters passband. While all this may be true, the appellant has failed to explain how the slow charging (i.e. integrating) of capacitor (592) during periods when transistor (59) is cutoff fails to meet the limitations of a low-

pass filter. As explained above in connection with point (1), the appellant's own disclosure indicates that a resistor in series with a capacitor whose output is taken at the junction of the resistor and capacitor forms a low-pass filter. At most, it may be conceded that the low-pass filter of Hwang demonstrates some non-linear properties during the time when the control transistor (59) is "turned-on," effectively shunting both terminals of capacitor (592) to ground. However, as the claim language does not stipulate that such an effect is undesirable or outside the scope of the invention, it is submitted that the appellant's interpretation of Hwang and low-pass filters in general is both moot and unpersuasive. Therefore, the rejections of these claims should be maintained.

b. Motivation exists to combine the teachings of Hwang et al.  
and Albouy:

On page 5 of the brief, the appellant alleges that there is no evidence to combine the teachings of Hwang and Albouy. The appellant alleges that the problem presented by the examiner does not exist because Schmidt triggers are notoriously well-known. In making the argument, the appellant appears to yield to the fact that "one of ordinary skill in the art would have used his common design knowledge...for Schmitt trigger 58 in Hwang et al." Such an admission appears to completely contradict appellant's argument. It is submitted that "common design knowledge" is nothing more than knowledge available to one of ordinary skill in the art at the time of the invention, i.e. the teachings of Albouy. In further support of the allegation, the appellant suggests that there is no particular reason provided by the examiner to use Albouy in particular. The

appellant provides further exhibits D and E, suggesting that other "well-known" Schmidt trigger designs were available. However, none of the exhibits D and E provide a Schmidt trigger for use within an apparatus directed toward interfacing with a telephony subscriber loop as the apparatus of Albouy does. Furthermore, the term "standard" as used by the examiner simply means that the trigger taught by Albouy was known at the time of the invention. The examiner respectfully declines the request for more evidence supporting the use of Albouy. As already established in the outstanding rejections, Hwang fails to teach the structure of a Schmidt trigger and Albouy teaches the construction of a Schmidt trigger as was available to one of ordinary skill in the art at the time of the invention. Therefore, the rejections of these claims should be maintained.

2. Claims 13, 17 and 18:

Claims 1-6, 20, 21 and 27-29 stand rejected under 35 U.S.C. § 103(a) as being obvious over U.S. Patent 5,987,120 (Hwang et al.) in view of U.S. Patent 4,540,853 (Albouy). The examiner respectfully disagrees with the appellant's assertion that any error occurred in rejecting these claims.

c. Hwang et al. in view of Albouy when combined makes  
obvious all claim limitations:

On page 6, lines 4-24, of the brief, the appellant alleges that the combination of Hwang and Albouy fails to teach or suggest all limitations of the claimed method. As shown above with respect to point (2), line reversals have a long silence interval, which allows capacitor (592) of Hwang to charge, whereas rings have a short silence interval, which prevents capacitor (592) of Hwang from charging. In this way, polarity reversals

shorter than a predetermined period of time are filtered out. Therefore, the rejections of these claims should be maintained.

d. Motivation exists to combine the teachings of Hwang et al.  
and Albouy:

On page 6, line 27, through page 7, line 4, of the brief, the appellant alleges that there is no motivation to combine Hwang and Albouy. The examiner disagrees for the same reasons presented herein under section (A)(1)(b). Therefore, the rejections of these claims should be maintained.

B. Claim 12 is unpatentable under 35 U.S.C. § 103(a) over Hwang et al. in  
view of Albouy and further in view of Bijman et al.

Claim 12 stands rejected under 35 U.S.C. § 103(a) as being obvious over U.S. Patent 5,987,120 (Hwang et al.) in view of U.S. Patent 4,540,853 (Albouy) and further in view of U.S. Patent 6,590,973 (Bijman et al.). The examiner respectfully disagrees with the appellant's assertion that any error occurred in rejecting this claim.

The appellant's allegations concerning this claim have been treated above with respect to points (A)(1)(a) and (A)(1)(b). Therefore, the rejection of this claim should be maintained.

**(11) Related Proceeding(s) Appendix**

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.



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Respectfully submitted,



Walter F Briney III

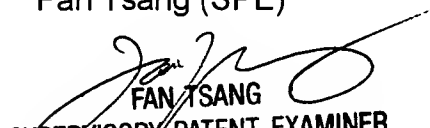
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